WHAT IS CLAIMED IS:

1. An engine, comprising:
   a. a rotating assembly including a primary compressor, an inner casing and a compressor-driving nozzle wheel;
   b. an outer casing, enclosing said rotating assembly; and
   c. a substantially annular flame holder encircling said inner casing within said combustion chamber;

so that at least one combustion chamber is defined in the space between said primary compressor, said inner casing, said compressor-driving nozzle wheel and said outer casing, characterized in that said outer casing does not rotate with said rotating assembly.

2. The engine of claim 1, wherein said at least one combustion chamber is substantially a single annular combustion chamber.

3. The engine of claim 1, wherein said rotating assembly includes a single said flame holder.

4. The engine of claim 1, wherein said flame holder is included in said rotating assembly.

5. The engine of claim 1, further comprising:
   c. a substantially tubular element surrounding said inner casing, wherein a leading edge of said tubular element is positioned aft of said primary compressor so as to divide airflow from said primary compressor into an outer airflow and an inner airflow, wherein said outer airflow is between said tubular element and said outer casing and wherein said inner airflow is between said tubular element and said inner casing

6. The engine of claim 5 wherein through said substantially tubular element are perforations allowing communication between said inner airflow and said outer airflow.

7. The engine of claim 1 further comprising:

c. a rotating diffuser between said primary compressor and said combustion chamber.

8. The engine of claim 7 wherein said rotating diffuser includes extensions to terminal blades of said primary compressor.

9. The engine of claim 1 wherein said rotating assembly further includes at least one fuel injector.

10. An engine comprising:

a. a combustion chamber having an axis; and

b. a combustion chamber compressor, coaxial with and radially inwards from said combustion chamber configured to counteract axial backflow in said combustion chamber.

11. The engine of claim 10 wherein said combustion chamber compressor includes:

c. at least two combustion chamber compressor blades arrayed about said axis of said combustion chamber in at least one circle; and

d. a substantially tubular combustion chamber compressor body encasing said combustion chamber compressor blades.

12. The engine of claim 10 further comprising:

c. a rotating combustion chamber inner casing coaxial with said combustion chamber;

d. at least two combustion chamber compressor blades rigidly attached to said rotating combustion chamber inner casing and arrayed about said axis of said combustion chamber in at least one circle; and

e. a substantially tubular combustion chamber compressor body encasing said combustion chamber compressor blades.

13. In an engine having a combustion chamber wherein a mixture of fuel and air is burned, a method of reducing NO_x emissions comprising:

a. making a combustible mixture by combining exhaust, fuel and air in a first region of the engine;

b. establishing an airflow vortex, within the combustion chamber, that creates a higher static pressure in a second region of the engine than in said first region of the engine; and

c. burning said combustible mixture in the combustion chamber;

wherein said exhaust is taken from said second region of the engine by said higher static pressure in said second region.

14. A method of cooling a blade of a bladed rotating wheel attached to the terminal end of a rotating axis through a blade base, comprising:

a. providing at least one substantially annular axial channel rotating with the rotating axis, said at least one channel having an inlet and an outlet;

b. feeding a cooling fluid into said at least one channel through said inlet; and

c. directing cooling fluid emerging from said channel through said outlet at an outer surface of the blade base.

15. The method of claim 14 further comprising:

d. increasing the pressure of said cooling fluid emerging through said outlet using a pressure-increasing device positioned inside said at least one channel.

16. The method of claim 14 wherein said bladed rotating wheel is a nozzle wheel and wherein said blade is a nozzle wheel blade.

17. The method of claim 14 wherein said bladed rotating wheel is a turbine wheel and wherein said blade is a turbine blade.

18. An engine, comprising:

a. a rotating assembly including a primary compressor, an inner casing and a compressor-driving nozzle wheel;

b. an outer casing, enclosing said rotating assembly; and

c. a combustion chamber compressor in said combustion chamber;

so that at least one combustion chamber is defined in the space between said primary compressor, said inner casing, said compressor-driving nozzle wheel and said outer casing, characterized in that said outer casing does not rotate with said rotating assembly;

19. The engine of claim 18, wherein said combustion chamber compressor comprises a plurality of combustion chamber compressor blades attached to said inner casing.

20. An engine, comprising:

a. a rotating assembly including a primary compressor, an inner casing and a compressor-driving nozzle wheel; and

b. an outer casing, enclosing said rotating assembly;

so that at least one combustion chamber is defined in the space between said primary compressor, said inner casing, said compressor-driving nozzle wheel and said outer casing, said compressor-driving nozzle wheel including a plurality of blades that define between them a corresponding plurality of nozzles, each said nozzle having a convergent-divergent shape.

21. An engine, comprising:

a. a rotating assembly including a primary compressor, an inner casing and a compressor-driving nozzle wheel; and

b. an outer casing, enclosing said rotating assembly;

so that at least one combustion chamber is defined in the space between said primary compressor, said inner casing, said compressor-driving nozzle wheel and said outer casing, the engine further comprising:

c. a free nozzle wheel aft of said compressor-driving nozzle wheel;

and wherein the engine lacks stator guide vanes between said nozzle wheels.

22. The engine of claim 21, wherein said free nozzle wheel includes a plurality of blades that define between them a corresponding plurality of nozzles, said blades being positioned so that gas jets that emerge from said nozzles emerge at an angle of at least about 82 degrees from parallel with a rotational axis of said rotating assembly.

23. An engine, comprising:

a. a rotating assembly including a primary compressor, an inner casing and a compressor-driving nozzle wheel; and

b. an outer casing, enclosing said rotating assembly;

so that at least one combustion chamber is defined in the space between said primary compressor, said inner casing, said compressor-driven nozzle wheel and said outer casing, wherein at least one of said primary compressor and said nozzle wheel is partly blocked.